Crystal (HCR™)

Consumer Grade Timing - XRCGB-F-L, XRCGB-F-M Series

HCR™ is a 100% crystal timing device, in a new hybrid package. The goal of HCR™ is low cost in a small 2016 package, targeting cost and size sensitive applications that do not need the tolerance offered by today's 50ppm crystals.

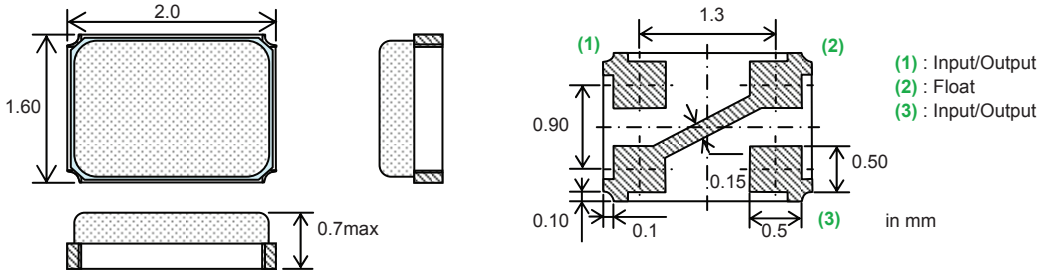
HCR™ is available in a sub 200ppm tolerance and sub 100ppm tolerance versions, at specific frequencies. HCR™ is suitable for consumer and industrial applications; automotive applications are not supported at this time.

Murata uses its own packaging technology that provides benefits of greater ruggedness and reliability, while not being reliant on outside vendor's packages. Its 2016 package is 4-terminal and can fit on the same pads of larger 4-terminal crystals (3225 & 2520), allowing for easy cost down of a design.

Key Features and Benefits

■ **Frequency**:	24.0000 / 25.0000 / 27.0000 / 27.1200 / 30.0000 / 33.8688 / 40.0000 / 48.0000MHz
■ **Tolerance:** (initial + temperature)	XRCGB-F-L (24 - 48MHz) : +/-150ppm XRCGB-F-M (24 - 30MHz) : +/-70ppm XRCGB-F-M (33.868 - 48MHz) : +/-85ppm
■ **Temperature Range:**	-30C to +85C
■ **Size:**	2.0 x 1.6 x 0.7mm

■ **Package:**



■ **Reliability:**	High shock resistance and high resistance to drive level (300uW max).
■ **Cost:**	Aggressive cost verse 3225 and 2520 crystals, while maintaining smaller size.
■ **ESR:**	100 to 150 Ω depending on frequency.
■ **Ease of Design:**	Suitable for Negative Resistance Analysis.

Target Applications (typical application tolerance & frequency provided)

Ethernet	+/-100ppm 25, 50MHz	HCR™ is appropriate for small size & low cost wired Ethernet controllers.
HDMI	+/-100ppm 27MHz	HDMI controller ICs can use the HCR™ tolerance.
SATA	+/-350ppm 25, 30, 40MHz	HCR™ is used today for this common interface for hard drive and optical disk drives.
USB 3.0	+/-300ppm 24, 25, 30, 48MHz	HCR™ is perfect for new emerging standard of USB 3.0 and is used with High Speed USB 2.0 IC controllers.
PCI-e	+/-300ppm 25MHz	New option for cost and size down with popular PCI-e bus controller ICs.

Crystal (HCR™) - Continued

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Promotional Strategy

Size:	HCR's 2016 size offers smallest cost-effective package on the market. The 2016 size is compatible with pads of larger crystal packages (3225 and 2520).
Package:	The construction of the HCR's water tight package allows for greater resistance to shock and drive level, while allowing for manufacturing reliability sorting of finished product, not possible with conventional ceramic packages.
Cost:	HCR™ is very competitive with 3225 cost, while offering a package smaller than 2520. Smaller traditional crystal packages typically command a premium cost.
Tolerance:	Many popular applications do not need the accuracy of a typical 50ppm crystal and can be easily supported by the smaller and lower cost HCR™, while still providing sufficient design margin.
ESR:	HCR™ ESR (equivalent series resistance) can be higher than typical crystals. Most ICs have sufficient gain to support HCR™ and maintain a sufficient level of margin. If there is any doubt, Murata offers a free evaluation service that can provide an exact recommendation.
Stable Supply:	Murata-made package technology means HCR™ is not dependant on outside suppliers for crystal's package, avoiding potential supply issues.

Available Part Numbers

Frequency (MHz)	+/-70ppm Tolerance (Initial + Temperature)	+/-85ppm Tolerance (Initial + Temperature)	+/-150ppm Tolerance (Initial + Temperature)
24.000	XRCGB24M000F3M00R0	---	XRCGB24M000F0L00R0
25.000	XRCGB25M000F3M00R0	---	XRCGB25M000F0L00R0
27.000	XRCGB27M000F3M00R0	---	XRCGB27M000F0L00R0
27.120	XRCGB27M120F3M00R0	---	XRCGB27M120F0L00R0
30.000	XRCGB30M000F3M00R0	---	XRCGB30M000F0L00R0
33.868	---	XRCGB33M868F4M00R0	XRCGB33M868F0L00R0
40.000	---	XRCGB40M000F4M00R0	XRCGB40M000F0L00R0
48.000	---	XRCGB48M000F4M00R0	XRCGB48M000F0L00R0

Common Questions to Ask:

1) What is your application?

2) Does it require an external timing device? Oscillator or Resonator (Crystal, Ceramic, LC)

3) What oscillation frequency is needed?

4) What frequency tolerance (initial + over temperature tolerance) does it require?
If the required tolerance is looser than 500ppm, please promote Murata's ceramic resonators.

5) If 50ppm or tight tolerance is requested, can a slightly looser tolerance be accepted for smaller size, with potentially lower cost?

6) Is a smaller size timing component a benefit to your application, if there is not a cost penalty?

7) Does your application require a more rugged component?

Information in this document is subject to change without notice.